

A47/A11 Thickthorn Junction

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Volume 6

6.1 Environmental Statement

Chapter 7 – Landscape and Visual

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**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

The A47/A11 Thickthorn Junction
Development Consent Order 202[x]

**ENVIRONMENTAL STATEMENT CHAPTER 7
LANDSCAPE AND VISUAL**

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7. Landscape and visual effects

7.1. Introduction

- 7.1.1. Highways England (the Applicant) has submitted an application for an order to grant a development consent order (DCO) for the A47/A11 Thickthorn Junction (hereafter referred to as ‘the Proposed Scheme’). The Proposed Scheme will create one new connector road between the A11 and A47 and provide a new link road between Cantley Lane South and the B1172 Norwich Road for continued access to the Thickthorn Interchange (refer to Figure 7.1 Site Location **(TR010037/APP/6.2)** which shows the extent of the Proposed Scheme design). Two new underpasses and two new overbridges will also be constructed along with improvements to the Thickthorn roundabout. The Proposed Scheme will reroute traffic away from the existing Thickthorn Interchange, which currently experiences delays and high levels of congestion during peak hours.
- 7.1.2. As part of the Environmental Impact Assessment (EIA) process, this Environmental Statement (ES) chapter presents the findings of the Landscape and Visual Impact Assessment (LVIA). This assessment includes a description of existing baseline conditions, consideration of the potential impacts of the Proposed Scheme upon surrounding landscape and visual receptors and identification of appropriate mitigation.
- 7.1.3. The approach to the assessment is consistent with the Scoping Report (February 2018) **(TR010037/APP/6.5)** and subsequent Scoping Opinion (March 2018) **(TR010037/APP/6.6)** for the Proposed Scheme, in combination with the most up to date standards for assessment in the Design Manual for Roads and Bridges (DMRB), LA107 Revision 2 Landscape and Visual Effects.
- 7.1.4. The main chapter text is supported by Appendices 7.1 to 7.7 **(TR010037/APP/6.3)**, which contain:
- A summary of relevant planning policy.
 - The viewpoint visualisation methodology.
 - The detailed assessment of the effects of the Proposed Scheme on landscape character, visual receptors and representative viewpoints (refer to Figure 7.4 Visual Context for the location of these viewpoints **(TR010037/APP/6.2)**).
 - The arboricultural survey and impact assessment (AIA).
 - The specialist assessment of lighting effects.
- 7.1.5. The assessment considers the effect of the Proposed Scheme on the surrounding landscape character, including its effect on existing vegetation (both woodlands and distinct individual trees) and other key or prominent landscape

features (such as watercourses and rural lanes) that contribute to that character and are located within the DCO boundary. The term 'landscape' is used throughout the assessment to refer to both 'landscape' and 'townscape' effects. The rural context means that no effects on the townscape character of urban areas would occur.

- 7.1.6. Landscape and visual effects are interrelated but distinct. Landscape effects relate to changes in the physical components or character of the area irrespective of their visibility (effects on the landscape resource), while visual effects refer to the change in view experienced by people in specific locations (referred to as visual receptors).

7.2. Competent expert evidence

- 7.2.1. Drawing on published assessment standards and professional guidance, landscape and visual assessment relies on an element of reasoned professional judgement. This assessment has been undertaken by Chartered Members of the Landscape Institute (CMLI) with experience in assessing the landscape and visual effects of large-scale infrastructure developments.
- 7.2.2. The landscape competent expert holds a BA (Hons) Degree in Landscape Architecture, CMLI status and over 20 years' experience working in the field of landscape assessment and design. This includes numerous large-scale highway schemes across the UK. The competent expert has also represented landscape and visual issues at topic hearings as part of the Nationally Significant Infrastructure Project (NSIP) application process and examination.

7.3. Legislative and policy framework

- 7.3.1. The legislative and policy context is considered in ES Chapter 1 Introduction (**TR010037/APP/6.1**). Relevant national and local landscape-related planning policy is summarised in Appendix 7.1 (Planning Policy Context) (**TR010037/APP/6.3**). The policies of greatest relevance to the potential landscape and visual effects of the Proposed Scheme are those set out within the National Policy Statement for National Networks (NPS NN) and within the South Norfolk Local Plan Development Management Policies Document (DMPD, South Norfolk Council, 2015). The NPS NN states that where a local development document in England has policies based on landscape character assessment, these will be given particular consideration. This is the case in South Norfolk.
- 7.3.2. The key legislative, planning policy and supplementary planning guidance themes of relevance to this assessment are as follows:

- Protection and enhancement of the value, quality and character of the landscape including its local distinctiveness and rural qualities (Policy DM 4.5 of the DMPD).
- Maintenance of the distinction between urban and rural areas and maintenance of the peaceful, rural character of the countryside in areas outside of settlements and away from the trunk road network (Policies DM 4.5, 4.6 and 4.7 of the DMPD).
- Maintenance of the strategic gap between the settlements of Hethersett and Cringleford (Policy DM 4.7 of the DMPD).
- Maintaining a landscape buffer between the A47 trunk road corridor and the growing settlement of Cringleford to the east (Policy DM 4.7 of the DMPD) (a landscape buffer of public open space is included within the masterplan for the current (January 2021) residential development taking place on the western fringes of Cringleford known as St Giles Park).
- The preservation and enhancement of the landscape setting of the Norwich southern bypass and its associated strategic views and gateway relationships with the City of Norwich (Policy DM 4.6 of the DMPD).
- Retention of veteran, mature or otherwise significant trees, groups of trees or woodland (and where removal is proposed, replacement with those of similar amenity value) (Policy DM 4.8 of the DMPD).
- Integration with the broader green infrastructure framework.
- Consideration of efficiency in long term maintenance implications.
- Adaptability to climate change.
- Integration of sustainability principles.
- Limitation of impact on night-time views and dark skies in rural areas.

7.3.3. Policies DM 4.5 Landscape Character, DM 4.6 Landscape Setting of Norwich and DM 4.7 Strategic Gaps of the DMPD all refer to the South Norfolk Landscape Assessment (SNLA, South Norfolk Council, 2001 updated in 2012). (The 2012 update further supports the importance of maintaining a 'strategic gap/important break' in the vicinity of the Proposed Scheme between Hethersett and Cringleford.)

7.3.4. The SNLA of 2001 provides a description and landscape strategy for each landscape character area identified in South Norfolk. The Proposed Scheme is located within landscape character area C1: The Yare Tributary Farmland with Parkland (paragraphs 11.1 to 11.12). Paragraph 11.11 sets the overall landscape strategy for this character area and reads:

The overall strategy is to conserve the peaceful rural character of the Yare Tributary Farmland and (sic) Parkland landscape and to maintain the clarity and distinction with the urban edge of Norwich. This will include:

- *Conservation of the narrow tributary corridors with their areas of grazed pasture and wet woodland;*
- *Conservation and enhancement of the historic parklands and designed landscapes and in particular ensuring that provision is made for appropriate*

long term management of these landscapes as new uses for sites come forward;

- *Management of the small farm woodlands which contribute to the more enclosed character, plus renewal of boundary hedgerow trees;*
- *Maintenance of the character of the rural lane network.*
- *Enhancement of the transportation corridors (Norwich Southern Bypass and A11) in this area and minimisation of their adverse impacts on landscape character;*
- *Protection of remnant historic churches and their setting.*

7.3.5. The strategy stated above is set out within the SNLA of 2001 and reinforced within the update of 2012. Although the SNLA is not strictly a policy document its content (and by implication its identified landscape strategy) is referenced by, and underpins, policies DM4.5, DM 4.6 and DM 4.7 of the adopted South Norfolk Local Plan. These strategic objectives have therefore guided the landscape and visual impact assessment of the Proposed Scheme and the development of the mitigation proposals set out in the Environmental Masterplan **(TR010037/APP/6.8)** and detailed in the Record of Environmental Actions and Commitments (REAC), contained within the Environmental Management Plan (EMP **(TR010037/APP/7.4)**).

7.4. Assessment methodology

Reference sources

7.4.1. Projects that require an EIA are assessed and reported in accordance with the standards and procedures set out within DMRB. DMRB in turn recognises other relevant professional guidance to inform the consideration of effects. This assessment of landscape and visual effects complies with the standards set out in DMRB and takes account of other professional guidance as follows:

- DMRB LA104 Revision 1 Environmental Assessment and Monitoring (Highways England, August 2020)
- DMRB LA107 Revision 2 Landscape and Visual Effects (Highways England, February 2020)
- Guidelines for Landscape and Visual Impact Assessment Third Edition (Landscape Institute & Institute of Environmental Management and Assessment, 2013) (GLVIA3)
- An Approach to Landscape Character Assessment (Natural England and Department for Environment, Food and Rural Affairs, 2014)
- Landscape Institute Technical Information Note 08/15, Landscape Character Assessment (The Landscape Institute, 2016)
- Landscape Institute Technical Guidance Note 06/19, Visual Representation of Development Proposals (The Landscape Institute, 2019)

Structure of assessment

- 7.4.2. An assessment of landscape and visual effects requires the following:
- Identification of landscape and visual **receptors** and a description of current baseline conditions.
 - An assessment of the **sensitivity** of the receptors to the type of change proposed (taking account of receptor susceptibility and value).
 - Identification of the **potential impacts** associated with the Proposed Scheme.
 - Identification of **mitigation**.
 - An assessment of the **magnitude** of change to landscape and visual receptors (considering the scale, extent, duration and potential reversibility of the change).
 - An assessment of the **significance** of the residual effect on the receptors taking account of the mitigation proposed.

Approach to assessment

- 7.4.3. The approach to assessment has comprised desktop study and site survey to establish the nature and extent of potential receptors, to identify their likely sensitivity, and to record the potential landscape and visual effects of the Proposed Scheme on them.
- 7.4.4. Landscape receptors with the potential to experience change as a result of the Proposed Scheme comprise the features of the landscape which are key or prominent contributors to landscape character (such as woodlands, distinctive individual trees, rural lanes or watercourses) and the overall landscape character area. An understanding of the direct physical effects of the Proposed Scheme on individual landscape features informs the assessment of the significance of the overall effect on landscape character.
- 7.4.5. The visual receptors with potential to experience change as a result of the Proposed Scheme comprise selected and agreed representative viewpoints as well as individual receptor locations (people in specific locations such as their homes, community facilities, places of work, public rights of way (PRoW) or roads). The assessment of the effects on representative viewpoints informs the assessment of the significance of the effects on the individual visual receptors whilst providing illustration of typical views of the Proposed Scheme.
- 7.4.6. The assessment of landscape and visual effects includes consideration of the following:
- Seasonal differences with or without the Proposed Scheme including summer with foliage and winter without foliage.
 - Both day and night-time situations with or without the Proposed Scheme.

- The effect of changes to or the removal of key existing landscape features (for example the removal of prominent existing individual mature trees or changes to a watercourse).
- The effect of temporary construction activity (for example, presence of plant, temporary buildings, materials stockpile areas, compounds, and construction traffic movements along haul routes).
- The effect of the introduction of new highway infrastructure (for example, earthworks, cuttings, carriageways, bridge structures, underpasses, signage and lighting).
- The effect of vehicles travelling along the Proposed Scheme.
- Wider forces for landscape character and visual change.

7.4.7. The approach to assessment of the night-time effects of lighting is reported in Appendix 7.7 (**TR010037/APP/6.3**). The assessment of night-time effects in Chapter 7 takes reference from Appendix 7.7 (**TR010037/APP/6.3**) to inform understanding of the effects of lighting on visual receptors. ES Chapter 7 does not however seek to replicate what is written in Appendix 7.7, so the two documents need to be read together to understand the relative nature and extent of night-time lighting effects.

7.4.8. The assessment considers the effects of the Proposed Scheme at the following stages taking account of any seasonal variations between winter and summer:

- During construction
- In the first year of operation immediately following completion of construction
- In the fifteenth year of operation once planting has gained a degree of maturity

7.4.9. In considering forces for landscape change and the duration of effects the assessment assumes the following approximate timescales for the delivery of the Proposed Scheme:

- Start of construction works – 2023
- Estimated duration of construction – 23 months
- Fully open to traffic – 2025

7.4.10. The assessment considers:

- Direct effects on the physical features that make up the landscape, for example existing woodlands, prominent individual trees, country lanes or watercourses.
- Indirect effects on the overall character and quality of the landscape, for example through the Proposed Scheme causing changes to the perception of landscape character as a result of the removal of some features and the introduction of new infrastructure.

- Direct effects on the visual amenity of visual receptors, for example changes caused by the Proposed Scheme to available views of the landscape for residents.

7.4.11. The potential combined and cumulative landscape and visual effects of the Proposed Scheme are considered in ES Chapter 15 (Cumulative effects assessment) **(TR010037/APP/6.1)**.

7.4.12. The outcome of the assessment has informed the planting proposals contained in the Environmental Masterplan for the Proposed Scheme **(TR010037/APP/6.8)**.

Update to standards and scope of assessment

7.4.13. Following a review of change to requirements following the publication of Revision 2 of DMRB Landscape and Visual Effects in 2020, the scope of this assessment has been updated from that included in the Scoping Report of the Proposed Scheme (2018) **(TR010037/APP/6.5)** to acknowledge the scoping criteria set out in DMRB LA107 and summarised in Tables 7-1 and 7-2 below.

7.4.14. Tables 7-1 and 7-2, in accordance with DMRB LA107 paragraph 3.9, set out the proposed scope for further assessment in the ES. Where the response to one or more of the scoping assessment questions is 'yes', further assessment has been undertaken.

Table 7-1 : Summary of proposed scope (landscape effects)

Scoping question	Comment	Scope in?
Is the project likely to affect designated landscapes (statutory or local designation)?	There are no general landscape protection designations associated with the Proposed Scheme study area therefore the Proposed Scheme would not affect any designated landscapes (statutory or local designation). The landscape at Thickthorn Hall is a County level designated historic park and garden. The effect on this is assessed in ES Chapter 6 Cultural heritage (TR010037/APP/6.1) .	No
Is the project likely to affect the distinctiveness of a landscape character area or type?	The perceived character of the host landscape character area may be affected by the Proposed Scheme. Change brought about during construction may exert a discordant influence on landscape character associations.	Yes
Is the project likely to affect national, regional or local characteristics or distinctive features?	Construction of the Proposed Scheme would involve removal of areas of woodland and some prominent individual trees which would initially bring about loss of existing landscape features. This effect would be re-balanced by the establishment of Proposed Scheme planting during operation.	Yes
Is the project likely to affect the condition or quality of a landscape?	Construction of the Proposed Scheme would involve removal and disruption to existing landcover, earthworks and construction activity, which would be at odds with the surroundings. This effect would be re-balanced by the establishment of Proposed Scheme planting during operation.	Yes

Scoping question	Comment	Scope in?
Is the project likely to affect the intrinsic character, qualities and local identity of the environment (sense of place)?	There is the potential for an effect on the quiet, rural, sense of place associated with areas around Cantley Lane South away from the main trunk road highway infrastructure.	Yes

Table 7-2 : Summary of proposed scope (visual effects)

Scoping question	Comment	Scope in?
Is the project likely to affect receptors (individuals or range of people) views and the visual amenity of the area?	The study area includes the western fringes of the built-up area of Cringleford, along with views from individual residential properties and PRow. Views have the potential to be affected during both construction and operation of the Proposed Scheme. Construction phase effects could include visibility of temporary construction compounds and visibility of traffic movements along temporary haul routes.	Yes
Is the project likely to affect the sensitivity of views to and from designated and/or valued landscapes, or from public rights of ways, public open spaces or from national trails?	There would be a direct impact on the County level designated historic park and garden at Thickthorn Hall. Views from the nationally registered Intwood Hall are unlikely. There are no national trails in the study area. Named paths to the south of the study area in the vicinity of Intwood Hall would be unlikely to gain views.	Yes
Is the project likely to affect a range of viewpoints and nature of views from which the project is visible?	The Proposed Scheme would be visible from a range of localised viewpoints associated with residential, recreational, commercial and road outlooks.	Yes
Is the project likely to generate significant visual effects (daytime or night-time)?	The Proposed Scheme has the potential to result in significant visual effects, most notably attributable to the construction phase (equipment, plant, temporary construction compounds, high sided vehicle movements along temporary haul routes and temporary road and footpath diversions) and early years of operation.	Yes

7.4.15. Since the issue of the Scoping Report there has also been a change in professional guidance on Visual Representation of Development Proposals (Landscape Institute Technical Guidance Note 06/19). Detail on the approach to visualisation is included in Appendix 7.2 (ZTV and Verified Photomontage Methodology) (TR010037/APP/6.3) but does not notably change the approach previously advised in the Scoping Report.

7.4.16. The changes in DMRB assessment standards and related professional guidance noted above does not affect the focus of points raised in the Scoping Opinion response, all of which have been considered and addressed in this assessment.

Consultation

- 7.4.17. Non-statutory public consultation was undertaken between 13 March and 21 April 2017. Where relevant, points arising from this previous consultation have been considered during the subsequent statutory processes.
- 7.4.18. A Scoping Report was submitted to the Planning Inspectorate in February 2018 **(TR010037/APP/6.5)**. No landscape or visual matters were proposed to be scoped out. A Scoping Opinion was received in March 2018 **(TR010037/APP/6.6)**.
- 7.4.19. Matters raised specifically relating to landscape (section 4.3 of the Scoping Opinion) included:
- (i) justify, consult and agree extent of study area for both the landscape and visual assessments (refer to Figure 7.1 Site Location) **(TR010037/APP/6.2)**
 - (ii) clarification of viewer height used for Zone of Theoretical Visibility (ZTV) generation
 - (iii) use of appropriate plans, cross sections and visualisations to communicate effects
 - (iv) mitigation (including locally appropriate species, aftercare, effectiveness over time and interaction with other topics such as biodiversity)
 - (v) clarification of the assessment methodology and criteria used for assessment of potentially obtrusive lighting (refer to Appendix 7.7 Lighting Assessment) **(TR010037/APP/6.3)**.
- 7.4.20. These requirements have been incorporated into the assessment and its associated appendices.
- 7.4.21. A preliminary environmental information report (PEIR) for the Proposed Scheme was produced in May 2019 and used to inform stakeholders during the statutory consultation period between 3 June and 11 July 2019.
- 7.4.22. Statutory consultee responses relevant to the potential landscape and visual effects of the Proposed Scheme have been reviewed and have been responded to within the scope and focus of this assessment and by the mitigation planting proposals included in the Environmental Masterplan **(TR010037/APP/6.8)**. The key issues raised by consultees were:
- (i) retention or treatment of veteran trees (Forestry Commission)
 - (ii) selection of low growing species where mitigation planting is proposed below overhead power lines (National Grid)
 - (iii) visual effects on properties along Cantley Lane South (Public Health England)

- (iv) mitigation measures to be sympathetic to local landscape character (Natural England)

7.4.23. Since the statutory consultation in 2019, further detailed consultation has been undertaken with South Norfolk Council as the local planning authority (LPA) to agree representative assessment viewpoint locations (undertaken in August 2019 and January 2020 and timed to correspond with summer and winter photography). The locations used were agreed by the LPA as being acceptable without further amendment in January 2020 (refer to Figure 7.4 Visual Context for the location of the agreed viewpoints) **(TR010037/APP/6.2)**.

Assessment criteria

7.4.24. The assessment criteria defined in DMRB LA107 have been used. The overarching criteria used for determination and definition of the significance of effects is as set out in DMRB LA104 (Revision 1 August 2020).

7.4.25. The significance of landscape effect has been determined by combining the sensitivity of the affected landscape (Table 3.22 in LA107) with the magnitude of change associated with the introduction of the Proposed Scheme (Table 3.24 in LA107). The evaluation of the sensitivity of the landscape resource is based on factors and attributes which affect the value of the landscape and the susceptibility of its character to change.

7.4.26. The significance of visual effect has been determined by combining the sensitivity of the visual receptor (Table 3.41 in LA107) with the magnitude of change associated with the introduction of the Proposed Scheme (Table 3.43 in LA107). The visual sensitivity of individual receptors depends upon the location and context of the view from the receptor, the activity associated with the receptor, and the importance likely to be attached to the available view. It is sometimes the case that different categories of visual receptor might be present at a selected representative viewpoint for example, a selected location may include both residential properties and road users suggesting different levels of sensitivity). In such cases the more sensitive receptor category is identified.

7.4.27. The assessment of the significance of residual landscape and visual effects (Tables 3.7 and 3.8.1 in LA104) takes into consideration mitigation measures implemented as part of the Proposed Scheme. Moderate, Large and Very Large effects are deemed 'significant'.

7.5. Assessment assumptions and limitations

7.5.1. Visual impacts have been considered based on site visits to publicly accessible areas, therefore it has not been possible to validate the potential for views from

all receptors, nor to exactly define the nature of views from all private locations. The site survey does however reflect the best estimate of those effects.

7.6. Study areas

- 7.6.1. The study areas for the assessment of the landscape and visual effects of the Proposed Scheme have been established with reference to criteria set out in DMRB LA104 'Environmental Assessment and Monitoring' (paragraph 3.13) and LA107 'Landscape and Visual Effects' (paragraphs 3.11 and 3.31). The study areas for both the landscape and visual assessments generally extend to 1km from the DCO boundary (refer to Figure 7.1 Site Location) (**TR010037/APP/6.2**). This distance is considered adequate given the limited vertical height of the components of the Proposed Scheme (the vertical elevation of the highway and earthworks is no greater than the A47 carriageway at the existing split-level Thickthorn Interchange) and the generally low lying, only gently rolling and well-wooded landscape context (the Proposed Scheme is not overlooked from higher ground) (refer to Figure 7.2 Landscape Context) (**TR010037/APP/6.2**). The main components of the Proposed Scheme with the potential to cause landscape or visual effects (such as the embankments and bridges) also coincide with the existing highway corridors of the A47 and A11. This presence of existing large scale highway infrastructure precludes any likelihood of significant landscape and visual effects occurring over distances of greater than 1km.
- 7.6.2. The study area for both the landscape and visual assessments identified on Figure 7.1 Site Location (**TR010037/APP/6.2**) includes areas to the west of Station Lane including parts of the settlement of Hethersett and some public rights of way (PRoW) such as at Suckling Lane. These areas lie in excess of 1km from the main components of the Proposed Scheme. The inclusion of these areas within the western fringes of the 1km study area is driven by the inclusion within the DCO boundary of a length of Norwich Road (between Hethersett and Thickthorn Farm) and the A11 (west of Station Lane). The scope of the Proposed Scheme along these roads on the western fringes of the identified study area is very limited. Works along Norwich Road are limited to minor areas of vegetation clearance and changes to signage within the existing tree lined road corridor. Therefore, except for Station Farm, visual receptors such as residential properties and footpaths to the west of Station Lane have been excluded from the study area for the detailed assessment of individual visual effects provided in Appendix 7.4 (Visual Receptors) (**TR010037/APP/6.2**). There would no significant visual effects caused by the Proposed Scheme to the west of Station Lane or upon any part of the settlements of Hethersett and Ketteringham.

7.7. Baseline conditions

- 7.7.1. The Site (defined as the extents within the DCO boundary) comprises an area of land around the existing junction of the A47 and A11 (refer to Figure 7.1 Site Location) (**TR010037/APP/6.2**). Immediately to the west of the existing junction are a range of services including restaurants, a hotel and a park and ride site serving Norwich.
- 7.7.2. The Site is in an otherwise rural location with the village of Cringleford (forming the south western fringes of Norwich) approximately 0.5km to the east; the Norfolk and Norwich Hospitals site approximately 1km to the north; and the village of Hethersett approximately 2km to the west. To the south lies a more extensive area of sparsely populated open countryside. Thickthorn Hall and its parkland lie between the Site and Hethersett to the west. There is current construction works (January 2021) to extend the urban footprint of Cringleford westwards and closer to the A47 and the Site. This residential development is known as St Giles Park and will include a buffer public open space between the new housing and the A47. The phased development of St Giles Park is expected to be largely complete by 2023 (the year within which the construction of the Proposed Scheme is programmed to begin).
- 7.7.3. The underlying natural topography is gently rolling with slightly higher land immediately to the north and east of the existing junction (to a maximum elevation within 1km of the main Proposed Scheme components near to the existing junction of approximately 35m above ordnance datum (AOD)) and lower ground associated with the course of Cantley Stream to the south (falling to approximately 15m AOD at the crossing of the stream by Cantley Lane South) (refer to Figure 7.2 Landscape Context) (**TR010037/APP/6.2**).
- 7.7.4. The carriageway of the A47 overbridge at the existing Thickthorn Interchange reaches a maximum elevation of approximately 34.5m AOD within the northern part of the Site. Higher ground (to approximately 50m AOD) is found on the far western fringe of the 1km study area around Hethersett and Ketteringham but this is located more than 1km away from the main components of the Proposed Scheme (for example the embankments and overbridges at the new Cantley Lane Link road) and does not overlook the Site. The alignment of the proposed new Cantley Lane Link road and its bridges over the A11 coincides with some of the lowest lying parts of the Site and study area associated with the shallow valley of Cantley Stream.
- 7.7.5. The Site location is characterised by the intersection of several major and minor roads, with associated earthworks, including the A47, A11 and B1172 Norwich Road. A mainline railway also runs through the southern part of the study area. This framework of linear transport corridors results in localised fragmentation of

the underlying landscape pattern which is not typical of the surrounding countryside.

- 7.7.6. Within this locally fragmented landscape, the level of tree cover is relatively high and predominantly comprises geometric blocks and linear belts associated with the highway infrastructure and services. Additional geometric blocks and belts are in the vicinity of Thickthorn Hall and may have been planted in mitigation of earlier highway development at the A11 and Thickthorn Interchange. In contrast, more informal woodland areas associated with the valley of Cantley Stream to the south and around Cantley Wood. Land between the A11 and B1172 Norwich Road is influenced by the presence of Thickthorn Hall resulting in areas of designed woodland and a higher frequency of mature, sometimes veteran, parkland-style trees (typically oak) sitting within open fields.
- 7.7.7. The predominant land use in the surrounding countryside is medium to large sized arable fields. However, the localised fragmentation of the landscape and presence of Cantley Stream result in a finer grained landscape pattern in the immediate vicinity of the Site with greater frequency of smaller, visually enclosed, pastoral fields.

Landscape

Landscape designations

- 7.7.8. There are no general protective landscape designations associated with the Proposed Scheme study area. The area is, however, identified in the adopted South Norfolk Local Plan (refer to Appendix 7.1 Planning Policy Context for further details) (**TR010037/APP/6.3**) as:
- Falling within the Norwich Southern Bypass Landscape Protection Zone (NSBLPZ) (Policy DM4.6) which seeks to protect the openness of the Zone and, where possible, enhance the landscape setting of the southern bypass and the approach to Norwich.
 - Providing a strategic gap between the settlements of Cringleford to the east (although falling outside of the City boundary effectively part of Norwich) and Hethersett to the west (Policy DM4.7) where retention of openness and rural character distinct from nearby built-up areas is sought.
- 7.7.9. The parkland at Intwood Hall on the southern fringes of the study area is a nationally registered grade 2 historic park and garden. It lies approximately 1.5km south east of the existing Thickthorn roundabout and Interchange but within approximately 500m of the south eastern extent of the Site where the proposed new slip road joins the A47 just north of the railway bridge.
- 7.7.10. Site assessment has identified that there is no potential inter-visibility with the Proposed Scheme due to existing woodland cover to the north of Intwood and

along the intervening railway. Although the Proposed Scheme extends close to the registered site, the topography, landcover and nature of the proposed works mean that there would be no potential effect on the registered landscape, and it is not assessed further.

- 7.7.11. The parkland at Thickthorn Hall is designated as an historic park and garden at County level. Its boundary is identified on the local plan proposals map and extends eastwards as far as the A11 corridor and the existing park and ride site (a proposed extension to the park and ride site falls within the designated area). Because of the northern section of the proposed new Cantley Lane Link road to the B1172 Norwich Road, and the proposed location of temporary construction compounds (one main, one satellite and two materials stockpile areas), this County level historic landscape will be directly impacted by the Proposed Scheme resulting in the removal of some trees (though retaining important individual parkland style and all but two of the veteran trees present), temporary use for construction activity, and the introduction of permanent new infrastructure.
- 7.7.12. The impact of the Proposed Scheme on the historic landscape associations of the remnant parkland at Thickthorn is factored into this chapter's overall assessment of landscape character effects (the name of the host landscape character area refers to the contribution of parklands to its character). Views from the landscape are represented by viewpoint D (refer to Figure 7.4 Visual Context) (**TR010037/APP/6.2**). A specific assessment of the effect of the Proposed Scheme on the heritage asset is also included in ES Chapter 6 Cultural heritage (**TR010037/APP/6.1**).

Landscape features

- 7.7.13. Consideration has been given to the direct, physical loss of, or changes to, notable existing landscape features as a result of the Proposed Scheme. Physical features in the immediate vicinity of the site which contribute to the landscape character of the wider area include; reasonably substantial areas of woodland and prominent individual trees along field boundaries and within remnant parkland settings; a local watercourse (Cantley Stream); and the local (non-trunk) road network of country lanes which contribute to the local rural character in the vicinity of Cantley Lane South.

Woodlands and individual trees

- 7.7.14. Woodland cover within the study area is substantial comprising a mixture of geometric blocks, linear belts and some more informally defined areas. Cantley Wood lies on elevated ground at the centre of the Site and study area comprising areas of deciduous woodland as well as areas of more recent

coniferous plantation (the latter associated with an area of historic landfill close to the northern of two scheduled barrows located within the wood).

- 7.7.15. Mature areas of woodland also lie to the north of the A11 associated with the fringes of the parkland around Thickthorn Hall. The tree belts in this area are long-established and are now substantial in height. Other woodland areas and linear belts include highway planting along the courses of both the A11 and A47 meaning that the lengths of these routes which lie within the study area are generally lined by trees resulting in a high degree of visual separation for both road users and surrounding visual receptors.
- 7.7.16. Individual trees of note within the study area associate principally with remnant parkland influences on the north of the A11 associated with Thickthorn Hall; roadside trees and wooded areas along and to the north of Cantley Lane South; and tree cover along the course of Cantley Stream. These include some veteran trees (further information below).
- 7.7.17. Hedgerows are infrequent within the study area and form the boundaries of only some fields (particularly the larger arable fields). Hedgerows (or rather 'hedgebank' field boundaries) tend to be irregular, informal and gappy with relatively limited evidence of regular trimming. This is particularly the case in the vicinity of Cantley Lane South and in areas bordering on Cantley Stream where the roadside takes on an irregular, natural and informal character.
- 7.7.18. Existing woodlands, trees and hedgerows within and immediately adjacent to the Site boundary have been the subject of an arboricultural survey (Appendix 7.6 Arboricultural Impact Assessment) (**TR010037/APP/6.3**). The arboricultural survey was undertaken in 2018 with additional areas added in 2020. The survey identifies 29 individual trees, 28 tree groups, 2 woodland areas (the two parcels combining to form Cantley Wood) and 2 hedgerows. Of these, 22 individual trees (almost all Pedunculate Oak, principally located to the north west associated with the wider landscape setting of Thickthorn Hall and along the roadsides of Cantley Lane South) and 2 tree groups (mixed native and ornamental trees located within the parkland at Thickthorn) are identified as category A. Of the 22 individual category A trees identified on the Site six are identified as being veteran. These are located to the rear of properties at the north eastern end of Cantley Lane South (T1, T2, T5 and T6) and at the south eastern fringe of the remnant parkland east of Thickthorn Hall close to the A11 (T13 and T14).
- 7.7.19. The predominant tree species in the study area are Pedunculate Oak (frequent throughout the study area including roadsides specimens and individual parkland-style trees in open areas), Ash, Sycamore and Field Maple. Evergreen species are not common, but Scots Pine is found within the study area.

Watercourses

- 7.7.20. Cantley Stream is a minor watercourse visible principally as a result of its associated vegetation and effect on adjacent land use (more frequently, smaller scale pastoral fields). The shallow valley landform associated with Cantley Stream passes west to east to the south of the main components of the Proposed Scheme (refer to Figure 7.2 Landscape Context) **(TR010037/APP/6.2)**. Such watercourses contribute to variability within the character of the local landscape introducing a higher level of enclosure, greater tree cover and ecological interest.

Local road network

- 7.7.21. Away from the main trunk routes the local road network contributes to the peaceful, rural character of the area. Kerbs, separate pedestrian walkways, signage and road markings are all generally absent from Cantley Lane South. Changes to the detailed design of carriageways, curbing, footways and signage has the potential to alter the existing rural character and erode its distinction from the nearby trunk road corridors.

National landscape character areas

- 7.7.22. The study area lies within National Character Area (NCA) 84; Mid Norfolk. This generally broadly flat, rural landscape is an ancient countryside with a long settled agricultural character but with pressures for change posed by growth, especially around Norwich. The landscape of the NCA becomes more rolling towards Norwich in the vicinity of the Site with increasing influences of pastoral river valleys. Key characteristics relevant to the study area include; the river valleys to the west of Norwich which create a more intricate landscape relative to the more typically flat, glacial till plateau; the patchwork of fields with sinuous lanes and mixed hedges with hedgerow oaks; and the fragmented mixed deciduous and pasture woodlands.

Local landscape character areas

- 7.7.23. Local landscape character has been established by reference to the South Norfolk Landscape Assessment (SNLA) (2001, reviewed and confirmed in 2012). This divides the surrounding area into three landscape character areas: The 'Yare Tributary Farmland with Parkland' (Area C1 in the SNLA) extends over most of the study area and includes all areas within the DCO boundary and all areas within 1km of the main components of the Proposed Scheme (the embankments and overbridges in the vicinity of Cantley Lane South immediately to the south of the existing junction). The 'Yare Valley Urban Fringe' (Area F1 in the SNLA) is located to the north east beyond the built-up area of Cringleford and just outside of the 1km radius study area. The Wymondham Settled Plateau

Farmland (Area D1 in the SNLA) captures the areas of higher ground on the far western fringes of the study area and more than 1km west of the main components of the Proposed Scheme near the existing Thickthorn Interchange. Refer to Figure 7.3 Landscape Character (**TR010037/APP/6.2**) for the extent of each character area identified by the SNLA.

- 7.7.24. The SNLA describes the Yare Tributary Farmland with Parkland as associating with a shelving landform with a gently undulating topography created by the presence of small tributary stream valleys (refer to Figure 7.2 Landscape Context) (**TR010037/APP/6.2**). It is described as a sparsely settled landscape at an area of transition between the rural and urban landscape with small farm woodlands and intermittently wooded tributary valleys which create a quiet, rural atmosphere.
- 7.7.25. The SNLA describes the Yare Valley Urban Fringe as characterised by areas of recent residential settlement on the perimeter of the City of Norwich at a point of transition between the Yare valley and surrounding landscape. The area is characterised by a broad semi-enclosed valley with a wide, flat, flood plain and enclosing valley sides, occasionally opening up to adjoining tributary river valleys. The area is strongly influenced by modern transportation corridors, in particular the Norwich Southern bypass.
- 7.7.26. The SNLA describes the Wymondham Settled Plateau Farmland as occurring to the southwest of Norwich, above the contour level 40m AOD and includes the medium sized settlements of Wymondham and Hethersett. It is identified as a relatively flat and open slightly elevated plateau landscape with limited areas of woodland or hedgerows and featuring larger settlements and market towns on its edges.
- 7.7.27. A substantial part of the study area to the north east of the Proposed Scheme comprises the built-up area of Cringleford village. The settlement of Cringleford is covered by the SNLA and spans the boundary of the two identified character areas, with most of its footprint falling within the Yare Tributary Farmland with Parkland. In the context of the low likelihood of townscape effects upon this settlement and due to the further residential development proposed on its western edge closest to the site, Cringleford has not been identified as a townscape character area meriting specific, separate assessment.

Assessment landscape character areas

- 7.7.28. The assessment initially adopted the three local landscape character areas identified by the SNLA as the spatial framework within which to consider the landscape character effects of the Proposed Scheme. No further sub-division of these already locally identified landscape character areas was considered

necessary (refer to Figure 7.3 Landscape Character **(TR010037/APP/6.2)** for the extent of each assessment character area). The underlying landscape character of the Site and its vicinity is typical of the Yare Tributary Farmland with Parkland (the host landscape character area for all areas within the DCO boundary), albeit locally overlaid by existing transport infrastructure.

- 7.7.29. An initial assessment of the potential for landscape character effects to arise beyond the host landscape character area was undertaken. This concluded that the landscape character effects of the Proposed Scheme would not extend beyond the host landscape character area of the Yare Tributary Farmland with Parkland (C1 in the SNLA). The Yare Valley Urban Fringe (F1 in the SNLA) is located just outside of the 1km radius study area. It is also a low lying landscape separated from the Site by the built up area of Cringleford.
- 7.7.30. The Proposed Scheme ZTV (refer to Figure 7.4 Visual Context) **(TR010037/APP/6.2)** shows the limited potential for views between this character area and the Proposed Scheme. There is therefore no potential for landscape character to be affected within the Yare Valley Urban Fringe. The Wymondham Settled Plateau Farmland (D1 in the SNLA) does extend to within the western fringes of the 1km radius study area. The inclusion of this area on the far western fringes of the study area is, however, driven by the DCO boundary extending to lengthy western sections of the B1172 Norwich Road and A11.
- 7.7.31. The scope of proposed works within the western extremities of these two highways within the DCO boundary is very limited (minor areas of vegetation clearance and the introduction of new highway surfacing and signage within existing highway corridors). The Wymondham Settled Plateau Farmland landscape character area lies more than 1km west of the proposed Cantley Lane Link road and overbridges and more than 2km west of the existing Thickthorn Interchange. Although the ground rises further to the west there is no potential for significant views of the Proposed Scheme from locations within the Wymondham Settled Plateau Farmland such that its landscape character could be affected by any component of the Proposed Scheme. The initial assessment therefore concluded that there would be no effect on this landscape character area and that further detailed consideration was not necessary.
- 7.7.32. A detailed baseline description of the Yare Tributary Farmland with Parkland (C1 in the SNLA) is presented in Appendix 7.3 (Landscape Character Area) **(TR010037/APP/6.3)**. The baseline landscape description includes a summary of the key characteristics of the landscape within the extents of the study area that have a bearing on the sensitivity of the character area to the Proposed Scheme (the key characteristics and attributes that are likely to be indicators of the sensitivity to the addition of further, and changes to existing, highway

infrastructure). The description includes the identification of a sensitivity rating of the landscape area relative to the Proposed Scheme. Table 7-3 below summarises the key characteristics and sensitivities.

Table 7-3 : Landscape character area baseline summary

Name and Reference	Summary description	Sensitivity (to the Proposed Scheme)
<p>Yare Tributary Farmland with Parkland (Area C1 In the SNLA)</p>	<p>Rolling/undulating rural landscape locally fragmented by major highway infrastructure and relatively high levels of tree cover. Sensitivities include areas of peaceful, rural character, tree cover and the more enclosed and diverse character associated with tributaries including Cantley Stream. The landscape is valued for its rural character distinct from nearby urban areas. Landscape sensitivity is locally moderated by the presence of existing highway infrastructure associated with the A11 and A47 corridors and the existing Thickthorn roundabout and Interchange. Forces for change include the current (January 2021) phased residential development on the western fringes of Cringleford and an associated planned buffer public open space which are anticipated to be completed by 2023 (approximately coinciding with the early phases of the construction of the Proposed Scheme).</p>	<p>Medium sensitivity</p>

Visual

Visual context

7.7.33. The southern, eastern and western extents of the study area associate with a gently rolling topography and extensive areas of tree cover along the main highway corridors, along field boundaries and forming distinct blocks of woodland. Consequently, the extent of views is relatively limited and includes glimpsed views of highway infrastructure associated with the existing split level Thickthorn Interchange and nearby footbridge over the A47 at Cantley Lane South, service area, park and ride facilities, high voltage overhead power lines and residential edge of Norwich. The northern extents of the study area include the potential for more extensive, open views across agricultural fields, though again influenced by the notable visual presence of high voltage overhead power lines.

Zone of theoretical visibility (ZTV)

7.7.34. A ZTV has been prepared to a 1km radius around the Proposed Scheme (refer to Figure 7.4 Visual Context) (**TR010037/APP/6.2**). The ZTV is based on digital surface modelling (DSM) data which includes the screening effect of landcover. The extent of ZTV is influenced by vegetation and topography, with some limitation afforded by built form. The ZTV captures the likely extent of potential

visibility associated with high-sided traffic movements along the main carriageways within the Proposed Scheme (assuming a height of 4m); the top of the highest proposed new earthworks (some of which rise above adjacent carriageway levels); and the top of the proposed new bridge structures at the new Cantley Lane Link road and at the replacement Cantley Lane Footbridge (Cringleford) over the A47 (which incorporates overhead steelwork). The Proposed Scheme ZTV is based on a viewer height of 1.6m which is compliant with the current DMRB standards and professional guidance which underpin this assessment (specifically paragraph 6.11 of GLVIA3).

7.7.35. The ZTV principally identifies local areas close to the Site with infrequent opportunities for longer distance views. The following are the principal reasons for the limited ZTV:

- The Proposed Scheme comprises generally low-lying new infrastructure with the principal trunk road component comprising a slip road in cutting below the existing junction.
- The more elevated components of the Proposed Scheme are limited to the new Cantley Lane Link road overbridges (carriageway rising to approximately 28m AOD), the new Cantley Lane Footbridge (Cringleford) (structure to approximately 37m AOD) and the proposed earth mounding immediately to the south of the existing Thickthorn roundabout (to approximately 39m AOD).
- The existing overbridge at the split level Thickthorn Interchange rises to a maximum carriageway elevation of approximately 34.5m AOD. This both creates a benchmark level within the locality and shields visibility of the Proposed Scheme in views from part of Cringleford to the east.
- The vicinity of the site is characterised by relatively high levels of tree cover including notable linear belts of screen planting along highways.

Notable visual elements and characteristics

7.7.36. The following visual elements and characteristics are notable within the study area:

- A prominent line of overhead electricity transmission towers running from north to south east on the western side of the existing A47 and passing over the Thickthorn services site.
- A generally continuous wooded skyline across most available views.
- Away from the trunk roads, services and park and ride site, views are predominantly open and rural in character with relatively infrequent urban influences.
- Visibility of the existing trunk road network carriageways is limited to only very occasional glimpses, but the presence of the network is notable through wider occasional visibility of large-scale signage on the approach to the Thickthorn roundabout and the movement of higher sided vehicles.

- In the immediate vicinity of the Thickthorn roundabout, 12m high lighting columns become a prominent element in some localised views.
- Localised visual clutter is associated with the services and park and ride site.

Night-time context

- 7.7.37. The Site and study area are in an essentially rural location. Despite the proximity of Cringleford, a short distance to the east, this rural character is locally valued, and local policies seek to maintain and enhance a clear distinction between rural and urban areas (Policies DM4.6 Landscape Setting of Norwich and DM4.7 Strategic Gaps of the South Norfolk Local Plan supported by the landscape strategy identified for the Yare Tributary Farmland with Parkland landscape character area in the SNLA, 2001). This is reflected in the current distribution of road lighting which is limited to 12m high columns at the existing Thickthorn Interchange (lower roundabout only); at the services; and at the park and ride site (all of which are reasonably visually enclosed). Elsewhere, lighting is limited. There is no highway lighting along the A11 and A47 approaches nor specifically to illuminate the elevated section of the A47 which passes over the lit roundabout below.
- 7.7.38. The proposed extension of the park and ride site into land towards Thickthorn Hall to the west of the existing park and ride has the potential to introduce additional lighting effects (construction had not begun by January 2021 and this development therefore remains uncertain). Furthermore, the proposed new residential development on the western edge of Cringleford (currently under phased construction in January 2021 and expected to be largely complete by the beginning of the construction of the Proposed Scheme in 2023) will bring the built-up footprint of the settlement closer to the route of the A47. The effect of these changes may make it increasingly more difficult to preserve the distinction between urban and rural areas in terms of lighting. That challenge suggests greater sensitivity to the effects of any additional highway lighting introduced as part of the Proposed Scheme.
- 7.7.39. The value of relatively low levels of existing lighting is that it accentuates the night-time distinction between built and un-built areas and limits adverse influence on the experience of the underlying rural context. As the existing extent of lighting is concentrated around the existing Thickthorn Interchange the surrounding areas may be susceptible to a spread or coalescence of lighting beyond existing limits. In general terms, a perceived increase in levels of lighting is likely to be less harmful when perceived from the more built up areas to the north and east, and more harmful when perceived from the more peaceful, rural areas to the south and west.

Representative Viewpoints

- 7.7.40. Eleven representative viewpoint locations have been selected and agreed with South Norfolk Council to assist in understanding the appearance and visual effects of the Proposed Scheme. The locations of representative viewpoints are shown in Figure 7.4 Visual Context (**TR010037/APP/6.2**). No specific landscape or visual sensitivities have been identified (with reference to any heightened designation value or focus on a key view) therefore viewpoints have been selected to represent the typical range of visual receptor types, viewing distances and directions associated with the study area.
- 7.7.41. Viewpoints are ‘representative’ and as such, whilst taken from a fixed point, are intended to reflect the range of visual aspects experienced by the receptors they represent. The interpretation of the significance of visual effects on individual representative viewpoints should therefore be recognised as more widely informing the assessment of effects on surrounding visual receptors locations.
- 7.7.42. The following Table 7-4 lists the representative viewpoints, identifying the key receptors that each represents.

Table 7-4 : Representative viewpoints baseline summary

Viewpoint reference	Location	Approximate distance (m) and direction from Proposed Scheme (closest component likely to be visible)	Reason for selection	Viewpoint sensitivity (to the Proposed Scheme)
1	Railside footpath	200m south	Footpath with likely views to Cantley Lane Link road and overbridges, glimpsed views to the north of the A11 towards Norwich Road.	Medium
2	Cantley Lane South (crossing of Cantley Stream)	Within the Site	Local road and residential properties with potential views of Cantley Lane Link road and overbridges.	High
3	Cantley Lane South (northern end adjacent A47)	Within the Site	Road users, footpath users (using footbridge) and nearby residential properties along Cantley Lane south.	High
4	South Cringleford housing (looking south)	250m north east	Residential properties on the edge of Cringleford (though further development proposed and is anticipated to be complete by 2023). Viewpoint is located on an informal footpath used by local people, but the path is not a PRow. Currently (September 2020) the path remains usable but is enclosed by fencing due to the adjacent construction works.	High

Viewpoint reference	Location	Approximate distance (m) and direction from Proposed Scheme (closest component likely to be visible)	Reason for selection	Viewpoint sensitivity (to the Proposed Scheme)
5	Cringleford footpath	300m north-east	Representative of views experienced by footpath users (though subject to residential development expected to be complete by 2023). Footpath is currently (September 2020) inaccessible due to falling within current construction works.	High
6	Norwich Road (Thickthorn Farm)	Within the Site	Road users (including dedicated shared cycle lane/pedestrian path).	Low
A	South Cringleford housing (looking west)	300m east	Residential properties on the edge of Cringleford (though further development proposed and expected to be complete by 2023). Viewpoint is located on an informal footpath used by local people, but the path is not a PRow. Currently (September 2020) the path remains usable but is enclosed by fencing due to the adjacent construction works.	High
B	Norwich Road (Park and Ride)	200m north	Residential properties on Norwich Road. Road users (including dedicated shared cycle lane/pedestrian path).	Low
C	North Cringleford	500m north east	Residential properties on the western edge of recently developed northern areas of Cringleford.	High
D	Thickthorn Hall	400m west	Residential properties and County registered parkland. NB this viewpoint is not a publicly accessible position. Access was arranged to enable consideration of visual effects on Thickthorn hall and parkland.	High
E	Station Lane (south of A11)	200m south west	Road users. Viewpoint included to capture potential effects of new junction with Station Lane and associated tree removal.	Low

7.7.43. Following discussion and agreement of the respective focus with South Norfolk Council, representative viewpoints have been divided into ‘visualisation’ views (1 to 6) and ‘baseline’ views (A to E). The assessment has considered visual effects on all viewpoints. Visualisation views have however been afforded a more detailed consideration (see Table 7-5) of the existing baseline and assessment of effects in recognition of the relative focus of interest in these views.

7.7.44. A description of the existing view at each viewpoint location is provided in Appendix 7.5 (Representative Viewpoints) (TR010037/APP/6.3). Baseline photographs of the view from each representative viewpoint location are presented in Figures 7.6.1 to 7.6.11 (TR010037/APP/6.2).

Table 7-5 : Representative viewpoints assessment reporting

Viewpoint location references	Viewpoint 'type'	Assessment detail	Baseline photo view	Proposed Scheme photomontage view
1 to 6	Visualisation	Detailed	Yes	Yes
A to E	Baseline	Detailed	Yes	No

Visual Receptors

7.7.45. Visual receptor locations are identified in Figure 7.5. Visual Receptors **(TR010037/APP/6.2)**. A description of the existing view from each receptor location is provided in Appendix 7.4 (Visual Receptors) **(TR010037/APP/6.3)**. Visual receptor categories comprise:

- Residential - private views from people's homes
- Community facilities – views from public buildings and facilities
- Commercial locations - views from people's places of work
- Public Rights of Way – views of footpath users
- Roads - views of people travelling along roads

7.7.46. The proximity of the Proposed Scheme to the existing A47, A11 and B1172 Norwich Road means that many of the visual receptors within the study area already experience existing views of highway infrastructure and traffic. As a result, the sensitivity of some receptors to visual change as a consequence of the Proposed Scheme is diminished.

7.7.47. Forces for landscape and visual change with the potential to affect the visual setting and views include areas of new residential development on the western fringes of the settlement of Cringleford (currently under construction – January 2021) and the proposed extension of the park and ride site west of the existing Thickthorn Interchange.

7.7.48. A summary of the type and location of the main visual receptor groups is provided below.

Residential receptors

7.7.49. The potential for views from residential properties includes the large number collectively grouped on the western fringes of Cringleford to the east of the A47 (including the Round House). The openness of such views will change over time due to new proposed residential development (currently under construction – January 2021) including a planned landscape buffer along the eastern side of the A47. This new development on the western fringe of Cringleford (known as St Giles Park) is being developed on a phased basis and is currently expected to be largely complete by the beginning of the construction phase of the Proposed

Scheme in 2023. It is likely, however, that the final phases of the residential development, including the laying out of the landscape buffer public open space between the new housing and the A47, is likely to be happening concurrently with the earlier phases of construction of the Proposed Scheme.

- 7.7.50. Residential receptors also include the more widely dispersed individual and short terraces of properties located across the study area to the north, west and south of the Proposed Scheme. Those most likely to be subject to visual change include properties along Cantley Lane South with components of the Proposed Scheme located in various directions. Elsewhere (such as at B1172 Norwich Road, Thickthorn Hall and Station Lane), potential views of the Proposed Scheme are often likely to be limited by existing intervening tree cover.
- 7.7.51. The value of views from residential properties associates with people's sense of identity and place. As such any change in view is likely to affect the viewers perception and experience of the outside world. The susceptibility of such views to change is therefore typically considered to be high but influenced by what is present in the existing view. It therefore follows that the visibility of existing roads or traffic may reduce susceptibility where similar features are proposed.
- 7.7.52. Residential receptors are generally considered to be **high sensitivity**, reducing to **medium sensitivity** where the existing A47, A11 or other highway infrastructure (for example the highway infrastructure associated with the services and park and ride site at the eastern end of Norwich Road) is a notable feature of the existing view.

Community receptors

- 7.7.53. Community receptors within the study area are limited to the railway, services, park and ride site, Cringleford Surgery and a day nursery.
- 7.7.54. The value of views from community receptors varies depending on their specific nature. The susceptibility and sensitivity of views to change is therefore also varied. The visibility of existing roads or traffic may also reduce sensitivity where similar features are proposed.
- 7.7.55. Community receptors are generally considered to be of **low to medium sensitivity**.

Commercial receptors

- 7.7.56. Commercial receptors are limited to two depots (a South Norfolk Council depot at Station Lane to the west and a vehicle storage depot at Thickthorn Farm on the B1172 Norwich Road to the north).

- 7.7.57. The value of views from commercial receptors would typically be limited where the focus of the individual would be on the immediate location rather than the wider outlook. The susceptibility of views to change is therefore relatively low but nonetheless influenced by what appears in the existing view. The visibility of existing roads or traffic may therefore reduce susceptibility where similar features are proposed.
- 7.7.58. Commercial receptors are generally considered to be of **low sensitivity**.

PRoW

- 7.7.59. The public right of way (PRoW) network within the study area is relatively limited in extent. Furthermore, some PRoW either fall within the existing built-up area at Cringleford or will be surrounded in future as further planned development is built out on Cringleford's western fringe (currently under construction – January 2021). The key footpaths in the assessment associate with Cantley Lane South and comprise a railside footpath to the south west and a short link and existing pedestrian footbridge over the A47 to the east.
- 7.7.60. The named Tas Valley Way and Kett's Country Walk fall within the southern fringes of the study area in the vicinity of Intwood. The Tas Valley Way runs for 40km from Cringleford to Attleborough, passing through 16 towns or villages. When outside of built up areas, the route crosses open countryside as well as following some minor roads. Within the study area this route follows Intwood Road. Kett's Country Walk falls partially within the study area. This country walk follows the same line as the Tas Valley Way. Site survey has established that views from both routes are screened by intervening tree cover and localised landform and they would not be subject to visibility of the Proposed Scheme. As such these routes are not considered further within the visual assessment.
- 7.7.61. Footpath receptors are generally considered to be of **high sensitivity**, but this may be moderated where the baseline visual amenity is poor or where there is evidence of very infrequent use.

Road receptors

- 7.7.62. Views of the Proposed Scheme would be experienced by road users of the A47, A11, B1172 Norwich Road and other local links and rural lanes.
- 7.7.63. The value of views from road receptors would typically be limited where the focus of the view would not be fixed on a particular outlook or visual relationship. As the receptor outlook is inherently that of a road, the susceptibility of views to change of a similar type is generally low. Higher sensitivity will however be associated with users of local lanes that contribute to the rural character of the area such as at Cantley Lane South.

7.7.64. Road receptors are generally considered to be of **low sensitivity** with users of some rural lanes considered to be of **medium sensitivity**.

7.8. Potential impacts

7.8.1. The main components and activities associated with the Proposed Scheme which have the potential to impact landscape or visual amenity are listed below.

Construction

- Removal of existing woodland, individual trees and areas of linear highway planting.
- Formation of new earthworks associated with:
 - the excavation of the new slip road in deep cutting
 - excavation of two sections of underpass (below the A11 and below the A47)
 - excavation of two surface water attenuation basins
 - grading of levels for the new embankments (including the new Cantley Lane Link road), carriageways, slip roads and overbridges (two vehicular over the A11 and one over the A47 for walkers, cyclists and horseriders)
 - realignment and raising of the carriageway of Cantley Lane South in the vicinity of Cantley Stream
 - extensive areas of proposed earthworks to the south of the existing Thickthorn roundabout (including raising levels and the formation of new bunds within the approximately 2ha reptile habitat enhancement area proposed between the Interchange and properties at the eastern end of Cantley Lane South)
- The realignment of an approximately 390m length of Cantley Stream through the excavation and formation of a replacement channel.
- The temporary presence of:
 - one main construction compound on land to the south of the B1172 Norwich Road (this will be located on the western side of the existing field through which the proposed new Cantley Lane Link road will pass)
 - two smaller satellite construction compounds - one on land to the south of the B1172 Norwich Road (to the east of the proposed main construction compound) and one north east of Cantley Wood
 - four materials stockpile locations – two south of the B1172 Norwich Road (between the proposed satellite compound and the park and ride site and adjacent the woodland belt on the western side of the main compound), one north east of Cantley Wood associated with the second satellite compound, and one west of the A47 south of Cantley Lane North adjacent Cringleford
 - a network of haul routes (with associated vehicle movements) – the haul routes would all fall within the DCO boundary and most would follow existing roads and tracks or the alignment of proposed new infrastructure (the only haul routes which would be temporarily formed and then restored back to an open land use are located along

a section of Cantley Stream close to the railway to the south and along the western edge of Cringleford which is already subject to current residential development)

- The general presence of construction activity, construction vehicles, plant and associated traffic management interventions to temporarily divert traffic and pedestrian movements.

Operation

- The introduction into the landscape of approximately 1.65km of new trunk and slip road carriageway and associated landforms (principally the new A11-A47 connector road between the A11 eastbound and A47 southbound).
- The introduction into the landscape of approximately 1km of new and realigned local roads and associated landforms (principally the new Cantley Lane Link road and realigned section of Cantley Lane South).
- The introduction of off-line elevated landforms to the south of the existing Interchange and the rear of properties at the north eastern end of Cantley Lane South.
- The introduction of the Cantley Lane Link road overbridges and associated embankments.
- The introduction of the replacement Cantley Lane Footbridge (Cringleford) and associated embankments.
- Introduction of two surface water attenuation basins and associated landforms.
- Creation of new length of replacement watercourse at Cantley Stream.
- The introduction of moving vehicles (visible and audible) in locations not currently impacted by the existing highway network.
- Introduction into the landscape of new areas of woodland, trees and hedgerows as mitigation.
- Introduction into the landscape of new road furniture, including safety barriers, boundary fencing and signage
- Introduction of new lighting (though largely replacing existing in its location, extent and height).

7.8.2. In the specific baseline context at Thickthorn, the principal potentially adverse and potentially significant landscape and visual effects of these impacts which have been the focus of this assessment and which have informed the key mitigation strategies adopted can be summarised as:

- The potential effect on the visual amenity of residential properties and footpaths due to views of the works, compounds and haul routes during the temporary construction phase.
- The potential effect on landscape character of the removal of tree cover including the removal of areas of woodland and of mature specimen trees from roadsides and remnant parkland areas and the opening-up of enclosed rural views around Cantley Lane South and Cantley Stream.
- The potential effect on both landscape character and views of the height and potential visual prominence of some new infrastructure (principally the

three overbridges) and associated embankments within the low lying landscape (the existing overbridge on the A47 at the split level Thickthorn Interchange has been used as a benchmark at 34.5m AOD).

- The potential effect on rural character of the geometry and detailed design of new Proposed Scheme components away from the main trunk roads. The junction of the new Cantley Lane Link road and realigned section of Cantley Lane South at Cantley Stream has been a focus in this respect.
- The potential effect on landscape character of changes to Cantley Stream.

7.9. Design, mitigation and enhancement measures

Construction phase

7.9.1. Mitigation during construction would comprise:

- keeping a tidy and organised site
- materials delivered on an 'as needed' basis to prevent unnecessary stockpiles
- protection of retained vegetation in accordance with British Standard (BS) 5837:2012 (Trees in relation to design, demolition and construction).

Operation phase

7.9.2. Based on a review of the landscape and visual policy context and taking account of the potentially adverse impacts of the Proposed Scheme identified above, the following overarching landscape and visual objectives were identified and have guided the iterative development of the Proposed Scheme design. Securing these objectives is embedded within the location, scale, extent and height of the highway geometry and earthworks design:

- To **minimise direct impacts on trees and woodlands** through avoidance - especially mature or veteran specimen trees (most frequently Oak) along roadsides and those within a parkland setting.
- To minimise the landscape effect and visibility of the main infrastructure (particularly the new Cantley Lane Link road overbridges and embankments) by **limiting the elevation of new infrastructure and earthworks** within this low-lying landscape and by providing adequate screen planting.
- To **maintain the distinction between the trunk road network and the underlying peaceful, rural landscape** by ensuring that components of the Proposed Scheme away from the main trunk roads (for example the Cantley Lane Link road and overbridges) are detailed in a way which is appropriate to the local vernacular and rural character and distinct from the treatment of the main A47 and A11 corridors.

7.9.3. The environmental masterplan sets out the additional proposed landscape and visual mitigation of the Proposed Scheme. At this more detailed level, mitigation aims to also achieve the following:

- Protection and enhancement of habitats that contribute to landscape character through:
 - Creation of a reptile habitat enhancement area south of the existing Thickthorn Interchange and improvements to water vole habitat along Cantley Stream
- Protection and enhancement of the landscape character and sense of place by:
 - retaining, away from the main trunk road carriageways, the sense of an underlying peaceful, rural landscape
 - creation of new areas of tree and woodland planting to compensate for losses
 - integrating Proposed Scheme infrastructure (notably the elevated Cantley Lane Link road overbridges) through appropriate use of planting to contribute to visual screening
 - retaining or replacing and reinforcing existing vegetation where this contributes to the distinctive qualities of the landscape
 - selecting plant species appropriate to the locality to maintain consistency with the appearance of the area
- Acknowledgement of the landscape setting of cultural heritage assets, most notably two scheduled barrows at Cantley Wood and retention of a milestone on the B1172 Norwich Road.
- Input to the alignment of fence lines to accommodate the extent of proposed planting areas.
- Input to the design of the Cantley Stream diversion.
- Input to the location and extent of drainage soakaways and surface water attenuation basins.
- Input to the lighting strategy to help maintain the distinction between urban and rural areas.
- Consideration of future maintenance with inclusion of pull in lay-bys and gated access points and the selection of plant and grass types that would require limited maintenance resources.
- Building in resilience for climate change by including diversity within the plant and grass species mixes to ensure that a range of species types suitable for a range of conditions are incorporated. Also taking into consideration the creation of soil conditions favourable to plant establishment under either dryer or wetter conditions.
- Sourcing plant and grass species of local provenance where possible in the interests of extending local flora and construction sustainability.

7.9.4. The proposed landscape and visual mitigation measures form part of a wider complementary association with other environmental mitigation functions derived from the requirements identified within the various ES chapters.

7.9.5. All proposed landscape and visual mitigation measures would be implemented by the year of opening (currently anticipated to be 2025) with a mitigation design year of 2040 (the date by which proposed planting would have established to a point of relative maturity in contributing to mitigation objectives). For the purpose of assessment, mitigation planting growth and height assumptions have been

defined in Table 7-6 below (subject to the variables of ground conditions, general climatic influences and individual species growth rates). These assumptions have been used in the production of photomontages (refer to Figures 7.6.1 to 7.6.6) **(TR010037/APP/6.2)**.

Table 7-6 : Mitigation planting growth and height assumptions

Planting type	Year of opening	Year 15
Individual trees (6-8cm light standards)	2.5m	6m
Woodland (transplants only)	0.6m	8m
Shrubs (transplants only)	0.6m	3m
Scrub (transplants only)	0.6m	1.5m
Hedgerow – trimmed (transplants only)	0.6m	2m
Hedgerow - informal (transplants only)	0.6m	3m

7.10. Assessment of likely significant effects

7.10.1. This section assesses the significance of the residual effects of the Proposed Scheme on landscape and visual receptors during both construction and operation. The overall assessment of each receptor considers seasonal differences between winter and summer and takes account of night-time views and the visual effects of lighting and night-time traffic movements. The assessments take into account the iterative design development process and incorporation of the mitigation and enhancement measures set out in the Environmental Masterplan **(TR010037/APP/6.8)** and REAC contained with the EMP **(TR010037/APP/7.4)**.

Construction

7.10.2. Construction would result in temporary disruption within the DCO boundary and within the landscape setting of the Proposed Scheme. This would include vegetation clearance and earthworks associated with the grading of levels for the carriageways, overbridges and drainage; and the presence of site compounds, construction vehicles, haul routes and machinery.

7.10.3. The removal of existing vegetation (particularly areas of woodland and prominent individual trees), realignment of Cantley Stream, highway diversions around Cantley Lane South, introduction of large scale earthworks and the presence of construction plant, materials, machinery and construction compounds would have adverse impacts on local landscape features and character during construction. Construction operations would be temporary but the residual effect on landscape character due to tree and woodland removal

during the construction phase is also factored into the assessment of operational phase effects.

Effects on landscape character

7.10.4. The detailed assessment of construction effects on landscape character is set out in Appendix 7.3 (Landscape Character Area) (**TR010037/APP/6.3**). The conclusions of the landscape character assessment are summarised in Table 7-7 below. There is only one landscape character area within the study area that required assessment.

Table 7-7 : Construction effects on landscape character (summary)

Name and Reference	Magnitude of change	Significance of effect
Yare Tributary Farmland with Parkland (Area C1 In the SNLA) (medium sensitivity – combining medium value and medium susceptibility)	Moderate adverse	Moderate adverse

7.10.5. Formation of new earthworks and infrastructure and the temporary presence of construction plant, materials, machinery, construction compounds, haul routes and construction lighting would occur during the temporary construction period. Overall, given the presence of and proximity to the existing interchange; the reasonably enclosed location limiting the geographical extent of influence; and the temporary nature of the construction period, the effect on the Yare Tributary Farmland with Parkland landscape character area of these temporary construction activities would be limited.

7.10.6. However, during construction areas of existing woodland and some existing individual trees, particularly a number of large and visually prominent specimens located along Cantley Lane South, would be felled to make space for the new infrastructure. Such tree removal is limited to the footprint of the Proposed Scheme and would not result from temporary access or construction working space requirements. Primarily as a consequence of this woodland and tree removal during the construction phase, the effect on the Yare Tributary Farmland with Parkland landscape character area during construction would be moderate adverse in magnitude and result in a **moderate adverse significance** of effect. The landscape character of the Site and its immediate setting would be affected to the greatest degree during construction at Cantley Lane South due to its relative isolation and current visual separation from the nearby existing trunk road network and due to the removal of a number of large trees. This effect would be quite localised and would not give rise to a wider effect on landscape character during the construction period.

Visual effects

General effects

- 7.10.7. The construction of the Proposed Scheme would bring about disruption to existing views. The removal of existing vegetation would lead to an increased openness in views and the disruption caused by construction earthworks combined with the diverse and extensive influence of construction vehicles, machinery, materials and haul routes would notably contrast with the rural surroundings away from the existing trunk roads.
- 7.10.8. The proposed network of temporary haul routes would generally follow existing roads, tracks and lanes or follow the alignment of components of the proposed new permanent infrastructure (for example the proposed Cantley Lane Link road; the slip road below the A11 and A47; and the various farm accesses and surface water attenuation basin accesses would all be used as haul routes during construction). Additional haul routes outside of the footprint of the proposed permanent infrastructure which would require restoration to open land after construction are limited to:
- A route along a section of Cantley Stream east of Cantley Lane South and close to the railway – this is to provide access to the stream for works to enhance water vole habitat
 - A route east of the A47 close to edge of Cringleford – this area is currently (January 2021) subject to phased residential development and the land would be restored to form a landscape buffer between the A47, a new area of proposed public open space and the new housing (it is anticipated that the residential development and buffer public open space at St Giles Park would be completed around 2023 coinciding with the early phases of the construction of the Proposed Scheme)
- 7.10.9. Many of the proposed haul routes would be in visually enclosed locations with limited potential visibility from surrounding residential properties and footpaths (for example in areas to the north west between the A11 and Norwich Road). Others would only be visible for people driving along the A11, A47 or the roundabout at Thickthorn Interchange which are not considered to be high sensitivity visual receptors. The presence of current (January 2021) residential development to the west of Cringleford also reduces the visual sensitivity here to any further haul routes east of the A47.
- 7.10.10. The principal locations where traffic movements on temporary haul routes would be visible from visually sensitive residential properties and footpaths are associated with the vicinity of Cantley Lane South. Visual sensitivity is greater here due to being set back from the existing A11 and A47 highway infrastructure in a rural setting:

- Residential properties at the north eastern end of Cantley Lane South close to the A47 would experience views of haul routes both to the front and rear of their properties and views would also occur from any continued use or diversion of the footpath over the existing A47 footbridge (receptors R1, R2 and FP2 considered in detail in Appendix 7.4 Visual Receptors) **(TR010037/APP/6.3)**
- Residents and footpath users close to Cantley Stream would experience views of haul routes in various directions (receptors R5, R6 and FP1 considered in detail in Appendix 7.4 Visual Receptors) **(TR010037/APP/6.3)** (refer also to Figure 7.5 Visual Receptors) **(TR010037/APP/6.2)**.

7.10.11. The main construction compound, two satellite construction compounds, and four materials stockpile areas are proposed in three locations. These three proposed locations are generally within visually enclosed areas away from sensitive visual receptors such as residential properties and footpaths. The visual effects during construction specifically associated with construction compounds and materials stockpile areas would therefore be very limited. The three principal areas comprise:

- Within the open field to the south of the B1172 Norwich Road through which the proposed new Cantley Lane Link road will pass: Although an open field, this parcel of land is enclosed by woodland belts to the west, north and east and views from residential properties or footpaths are limited to potential long distance glimpses across the route of the A11 from the railway-side footpath to the south (receptor FP1 in Appendix 7.4 Visual Receptors) **(TR010037/APP/6.3)** (refer also to representative viewpoint 1 in Figure 7.6.1) **(TR010037/APP/6.2)** and possible winter views through mature tree cover from adjacent East Lodge (receptor R11 in Appendix 7.4 Visual Receptors) **(TR010037/APP/6.3)**.
- On open land to the north east of Cantley Wood: There is no visibility to this location from surrounding residential properties and footpaths due to surrounding woodland and existing highway infrastructure.
- East of the A47 close to Cringleford. Current (January 2021) residential development in this vicinity reduces visual sensitivity here and would prevent views from existing properties at Cringleford.

Night-time effects

7.10.12. It would be anticipated that construction operations would largely be undertaken during daylight hours, but with potential for some construction lighting. This would be expected to be concentrated within site compounds and around the locations of overbridges and underpasses. The main construction compound, satellite compound and materials stockpile areas would be located within a visually enclosed land parcel between the A11 and the B1172 Norwich Road. Visibility to activity within this land parcel during the construction phase of the Proposed Scheme would be limited. There are no nearby residential properties or PRoW that would be affected.

7.10.13. The proposed satellite compound and materials stockpile area north east of Cantley Wood is in a similarly visually enclosed position with no potential views from residential properties or PRow. A fourth materials stockpile area to the east of the A47 would likely be more visible from properties and footpaths on the western edge of Cringleford but this is less likely to be used during hours of darkness and would be seen in the context of views towards existing highway infrastructure. The wider vicinity is also currently (January 2021) subject to extensive residential development reducing the area's sensitivity.

Effects on representative viewpoints

7.10.14. The detailed assessment of construction phase effects on representative viewpoints is set out in Appendix 7.5 (Representative Viewpoints) **(TR010037/APP/6.3)**. This takes account of all aspects of construction including temporary construction compounds, materials stockpile areas and haul routes. The conclusions of the visual assessment are summarised in Table 7-8 below.

Table 7-8 : Construction effects on representative viewpoints (summary)

Viewpoint reference	Sensitivity	Magnitude of change	Significance of effect
1. Railside footpath	Medium	Moderate adverse	Moderate adverse
2. Cantley Lane South (crossing of Cantley Stream)	High	Major adverse	Large adverse
3. Cantley Lane South (northern end adjacent A47)	High	Major adverse	Large adverse
4. South Cringleford housing (looking south)	High	Minor adverse	Slight adverse
5. Cringleford footpath	High	Minor adverse	Slight adverse
6. Norwich Road (Thickthorn Farm)	Low	Moderate adverse	Slight adverse
A. South Cringleford housing (looking west)	High	Minor adverse	Slight adverse
B. Norwich Road (Park and Ride)	Low	Negligible adverse	Neutral
C. North Cringleford	High	Negligible adverse	Slight adverse
D. Thickthorn Hall	High	Minor adverse	Slight adverse
E. Station Lane (south of A11)	Low	Minor adverse	Neutral

7.10.15. The largest construction effects on representative viewpoints would associate with those locations in closest proximity to the Proposed Scheme, particularly away from the existing trunk road infrastructure at Cantley Lane South. Representative viewpoint 2 is located within the Site close to the proposed new junction between the Cantley Lane Link road and the realigned section of Cantley Lane South. Visual change during construction in this vicinity would be

major adverse in magnitude and works here are likely to extend over much of the overall construction programme. This viewpoint is representative of the visual effect during construction that is likely to be experienced by three residential properties (at 128 Cantley Lane South and at No's. 1 and 2 Bridge Cottages) and from the eastern end of the railside footpath as it joins Cantley Lane South.

7.10.16. Representative viewpoint 3 at the eastern end of Cantley Lane South is also located within the Site but the scope of works proposed here is less. Formation of the replacement Cantley Lane Footbridge (Cringleford) and embankments would lead to visual change during that part of the construction programme but unaffected views over countryside to the south would persist.

7.10.17. Representative viewpoint 1 from the railside footpath would afford slightly elevated views towards the construction of the new Cantley Lane Link road and overbridges and glimpsed views across the A11 to the north to the site of the proposed main construction compound, satellite construction compound and one of the materials stockpile areas. The viewpoint is nevertheless set back from the works limiting the adverse effect on the view.

Effects on visual receptors

7.10.18. The effects on visual receptors within the study area (including all aspects of construction including temporary construction compounds, materials stockpile areas and haul routes) are reported in detail in Appendix 7.4 (Visual Receptors) **(TR010037/APP/6.3)**. Receptors are located and the effects upon them summarised by Figure 7.5 Visual Receptors **(TR010037/APP/6.2)**. This graphically communicates the distribution and extent of the significant visual effects anticipated during the construction phase of the Proposed Scheme. A summary of construction effects on each receptor type is provided in Table 7-9.

Table 7-9 : Construction effects on visual receptors (summary)

Visual receptor type	Significance – number of visual receptors affected				
	Very large adverse	Large adverse	Moderate adverse	Slight adverse	Neutral
Residential	1	2	1	7	9
Community	0	0	0	0	5
Commercial	0	0	0	0	2
PRoW	0	0	2	0	2
Roads	0	0	1	3	2

7.10.19. The following provides a general overview of the effects on each receptor type, summarising the potential nature, extent and significance of visual effects that would occur across the study area.

Residential receptors

7.10.20. The residential receptors identified in Table 7.9 that would be subject to a significant visual effect during construction are as follows:

- The six northern-most properties (in a horse-shoe formation) at the north eastern end of Cantley Lane South (closest to and potentially visually enclosed by the replacement Cantley Lane Footbridge (Cringleford) ramp and embankment) (R1 – Large adverse)
- The additional six properties at north western end of Cantley Lane South (R2 - Moderate adverse)
- [REDACTED] (R5 - Large adverse)
- [REDACTED] at Cantley Lane South (R6 – Very large adverse) – particularly No.1 Bridge Cottages closest to the proposed works with side and rear views overlooking construction activities at close quarters

7.10.21. All these properties are located at Cantley Lane South (refer to Figure 7.5 Visual Receptors **(TR010037/APP/6.2)** which graphically summarises the extent and distribution of these significant visual effects during construction). Effects would arise as a result of views of construction activity and haul routes in various directions and over short distances. The level of visual disruption along Cantley Lane South during construction would be large and would take place against a baseline of what is a relatively peaceful, rural lane set back and visually separated from the nearby existing A47. In addition, rear views are available from [REDACTED] towards the location of the proposed replacement Cantley Lane Footbridge (Cringleford), but the temporary visual effect on these two properties is considered unlikely to be significant.

7.10.22. Additionally, slight adverse (not significant) visual effects may be experienced during construction at properties close to the proposed main construction compound off Norwich Road and at properties on the western fringes of Cringleford. Potentially affected properties include [REDACTED] (immediately adjacent the proposed satellite compound and materials stockpile area), [REDACTED] and the five properties located at Thickthorn Hall (possible glimpses from upper storey windows). In all cases these properties are largely screened from the proposed compound but glimpsed views during winter months may be possible.

7.10.23. Slight adverse (not significant) effects may also be experienced from upper storey windows of properties on the western fringes of Cringleford towards, relatively distant, construction activity including the use of tall plant and erection

of the replacement Cantley Lane Footbridge (Cringleford) that would be partially visible above existing tree cover along the A47.

Community and commercial receptors

7.10.24. The generally low to medium sensitivity of community and commercial receptors means that none would be subject to a significant visual effect during the temporary construction works.

PRoW

7.10.25. The footpaths that would be subject to a significant visual effect during construction are as follows:

- Railside footpath (Hethersett FP6) (FP1 - Moderate adverse)
- Short footpath link over the existing pedestrian footbridge over the A47 (Cringleford FP4) (FP2 - Moderate adverse)

7.10.26. These footpath routes would be subject to a similar effect to residential properties along Cantley Lane South. Effects would arise as a result of views of construction activity and haul routes in various directions and over short distances. The level of visual disruption along Cantley Lane South during construction would be large and would take place against a baseline of what is a relatively peaceful, rural area set back and visually separated from the nearby existing A47.

7.10.27. There are no additional footpaths that would be subject to slight (not significant) adverse visual effects during construction.

Road receptors

7.10.28. The low sensitivity of road receptors generally means that they would not be subject to a significant visual effect during the temporary construction works. A significant moderate adverse effect would however occur at Cantley Lane South for the reasons outlined above for residential properties and footpaths in this area.

Operation

7.10.29. The following section considers the landscape and visual effects of the Proposed Scheme during operation. Assessments are undertaken in the year of opening and in year 15.

Landscape effects

7.10.30. Affected landscape features would include areas of woodland and distinct individual trees; Cantley Stream; and the non-trunk local road network of lanes.

7.10.31. The impact of the Proposed Scheme on landscape features principally associates with the removal of individual trees and areas of woodland at the following locations:

- A reasonably extensive area of mature woodland cover on the north western side of the existing A11 to make way for the proposed new slip road in cutting and the new Cantley Lane Link road overbridges (parts of G23 and G24 and including veteran trees T13 and T14 in the AIA). This is in part highway planting of limited value but also includes more substantial and mature wooded areas just south of the Park and Ride site and two veteran trees.
- Roadside trees and woodland south of the A11 in the vicinity of the Cantley Lane Link road overbridges, embankments and new junction with the realigned section of Cantley Lane South (Parts of W1 and W2 and including individual trees T32, T35, T36 and T37 along Cantley Lane South in the AIA). This would include some large, mature and valuable individual roadside trees which contribute to rural character in this location (for example, T32 towards the railway bridge).
- Tree cover immediately to the south of the existing Thickthorn Interchange and roundabout (G6 and T3 in the AIA). This tree cover is generally of limited value but includes one mature Grade A tree (T3).
- Mature trees on the B1172 Norwich Road at its new junction with the Cantley Lane Link road. An existing tree belt must be punctured and cut back to form the new junction and its required visibility splays (part of G20 in the AIA).
- Areas of linear highway planting in the vicinity of the replacement footbridge over the A47 and new slip road below (G4 in the AIA). These trees are of relatively limited value.
- Areas of linear highway planting on the north eastern side of the A47 south of the replaced footbridge (G4 in the AIA). An area of re-grading of existing embankments is necessary resulting in an extensive area of tree removal. These trees are of relatively low value, but the road corridor would be opened to views from Cringleford.

7.10.32. Cantley Stream would be redirected over a length of approximately 200m. This would coincide with the proposed new junction between the existing Cantley Lane South and the proposed new Cantley Lane Link road with the new watercourse flowing directly below the proposed 'T' junction. Views of the watercourse may be retained from the 'T' junction.

7.10.33. Several alterations to the non-trunk local road network are proposed which could cumulatively adversely affect the distinct rural character which exists in areas such as Cantley Lane South. These comprise:

- Widening and changes to the embankments where Cantley Lane South passes below the railway line.
- New farm access track junction (resulting in the removal of T32 in the AIA).

- Changes to alignment of Cantley Lane South and new 'T' junction at the Cantley Stream crossing.
- New footpath embankment, farm access and turning head at the north-eastern end of Cantley Lane South.

7.10.34. Removal of some areas of woodland, two veteran trees (T13 and T14 north of the A11) and some notable individual mature trees at Cantley Lane South (for example, T32) has been determined as unavoidable. Delivery of modern highway standards has necessitated realignment of a section of Cantley Stream and the creation of a wider, standard highway junction (with segregated pedestrian and cycle lanes) at Cantley Lane South which is currently a very narrow rural lane.

7.10.35. At year 15 of operation the establishment of Proposed Scheme woodland, individual trees and hedgerows would notably contribute to the reinforcement and enhancement of landscape features and contribute to integration of the Proposed Scheme into its setting. The redirected section of Cantley Stream would also have matured to more closely reflect baseline conditions. Changes to widen the new junction at Cantley Lane South would 'bed in' and 'soften' over time and the existing rural character characterised by the currently narrow lane would be partially restored. Adverse residual effects after 15 years would be associated with the irreplaceable loss (within a fifteen year time horizon) of the two veteran trees north of the A11 and of several mature roadside trees at Cantley Lane South (most notably T32).

Effects on landscape character

7.10.36. The detailed assessment of operational effects on landscape character is set out in Appendix 7.3 (Landscape Character Area) **(TR010037/APP/6.3)**. The conclusions of the assessment are summarised in Table 7-10 below. There is only one landscape character area within the study area that required assessment.

Table 7-10 : Operation effects on landscape character (summary)

Name and Reference	Year 1 (winter)		Year 15 (summer)	
	Magnitude of change	Significance of effect	Magnitude of change	Significance of effect
Yare Tributary Farmland with Parkland (C1 in SNLA) (medium sensitivity – combining medium value and medium susceptibility)	Moderate adverse	Moderate adverse	Minor adverse	Slight adverse

7.10.37. The new A11 to A47 slip road in deep cutting linking the A11 eastbound to the A47 southbound would hug the existing junction infrastructure resulting in little effect on the wider surrounding landscape character. Similarly, the earthworks

that would raise levels to the south of the existing Thickthorn Interchange would tie into that existing highway infrastructure with little wider effect.

- 7.10.38. Changes in landscape character would principally associate with the removal of areas of woodland and tree cover (most notably woodland just to the north of the A11 where the new slip would enter cutting and individual large trees at Cantley Lane South); with the introduction of the additional overbridges at the new Cantley Lane Link road; and with the changes that would take place to create the new junction of the Cantley Lane Link road with the realigned section of the existing Cantley Lane South. In this latter location, due to its geometry and design meeting modern standards, the new local road highway infrastructure would differ in character to the existing very narrow, tree-lined and informal rural character at Cantley Lane South. This change to the underlying quiet rural character of the area would however be very localised.
- 7.10.39. The new Cantley Lane Link road between the A11 and B1172 Norwich Road to the north would pass through the centre of an open field which falls within the remnant parkland associated with Thickthorn Hall. This area is locally designated for its historic landscape character. The land is currently under arable cultivation and its historic character is much altered. It is visually enclosed to the west, north and east by mature tree belts which also physically separate it from other areas of parkland closer to the Thickthorn Hall to the west. The environmental masterplan shows how this part of the new link road would avoid existing parkland trees and be designed to complement the existing open parkland character with open, fenced boundaries and the inclusion of occasional dispersed specimen trees.
- 7.10.40. Overall at year of opening, there would be a moderate adverse magnitude of landscape change which would result in a **moderate adverse (significant)** effect on the landscape character of the Yare Tributary Farmland with Parkland due to the relative prominence of Proposed Scheme infrastructure (including the Cantley Lane Link road overbridges); due to the residual year of opening loss of mature trees and woodlands relative to the existing baseline and due to the newly created junction at Cantley Lane South.
- 7.10.41. By year 15 of operation, the establishment of Proposed Scheme landscape mitigation would contribute to a reduction in the magnitude of landscape change. However, localised residual landscape character effects would remain as an outcome of the changes associated with enlarged junction and overbridges at the Cantley Lane link road. There would be a degree of erosion of the distinct underlying rural character away from the existing trunk road infrastructure. Despite the integrating contribution of new planting, a localised **slight adverse (not significant)** effect on the landscape character of the Yare Tributary Farmland with Parkland would persist at Cantley Lane South.

Visual effects

Zone of theoretical visibility (ZTV)

7.10.42. Figure 7.4 Visual Context (**TR010037/APP/6.2**) shows the extent of potential visibility of the Proposed Scheme in relation to visibility of the carriageway, vehicles and general highway infrastructure. The relative significance of effects within the extent of ZTV is considered within the representative viewpoint assessment and assessment of effects on visual receptors reported below.

General effects

7.10.43. In the winter of year of opening, prior to the establishment of Proposed Scheme landscape mitigation, there would be potential for visual effects associated with views of road infrastructure and vehicles. This would include views experienced by occupiers of residential properties, recreational users of PRoW, users of local community facilities, workers in commercial premises and vehicle travellers.

7.10.44. By summer of year 15 of operation, the establishment of Proposed Scheme landscape mitigation would contribute to a reduction in the extent and magnitude of visual change.

Seasonal differences in visual effects

7.10.45. The assessment of visual effects upon viewpoints and receptors in both year 1 and year 15 considers the degree to which levels of visibility would change between winter and summer due to changes caused by deciduous summer foliage. Where a notable seasonal difference is likely to occur, this is identified within the detailed assessments. In general, however, seasonal variations in the visual effects of the Proposed Scheme between winter and summer in either year 1 or year 15 are more limited for the Proposed Scheme than is sometimes the case. This is because screening is often delivered by vegetation of sufficient depth to ensure that screening would be maintained in winter months (for example, there would be limited seasonal variation in the visibility of the overbridges on the Cantley Lane Link road because retained surrounding woodland belts and areas of woodland are of sufficient depth to successfully screen the Proposed Scheme even in winter months). It also reflects that the principal new trunk road element of the Proposed Scheme is a new slip road in deep cutting which will be screened by the cutting landform rather than rely on adjacent vegetation. Most of the significant visual effects identified by the assessment occur upon receptors that are located in very close proximity to the proposed new infrastructure (notably along and in the vicinity of Cantley Lane South) where the visual change is due to that proximity and would be largely unchanged across different seasons (for example, residential properties located immediately adjacent the proposed new junction between Cantley Lane South and the new Cantley Lane Link road would experience views year-round).

Night-time effects

7.10.46. Proposed Scheme lighting and vehicle headlights would result in night-time effects on views. New effects (beyond the existing highway infrastructure) would be most apparent around the Cantley Lane Link road and overbridges. Here there is the potential (until proposed planting on the embankment matures) for headlights to be directed towards the rear of No 1 Bridge Cottages from traffic heading south east along the new link road.

Effects on representative viewpoints

7.10.47. The detailed assessment of operational effects on representative viewpoints is set out in ES Appendix 7.5 (Representative Viewpoints) **(TR010037/APP/6.3)**. These assessments take account of visual effects in both winter and summer and during the night. The conclusions of the visual assessment are summarised in Table 7-11 below. Where the effect in summer and winter would differ the worst case winter assessment is included in Table 7-11. Refer to Figures 7.6.1 to 7.6.12 **(TR010037/APP/6.2)** for photo illustration of the respective viewpoints.

Table 7-11 : Operation effects on representative viewpoints (summary)

Viewpoint	Sensitivity	Year 1		Year 15	
		Magnitude of change	Significance of effect	Magnitude of change	Significance of effect
1. Railside footpath	Medium	Moderate adverse	Moderate adverse	Minor adverse	Slight adverse
2. Cantley Lane South (crossing of Cantley Stream)	High	Major adverse	Large adverse	Minor adverse	Slight adverse
3. Cantley Lane South (northern end adjacent A47)	High	Minor adverse	Slight adverse	No change	Neutral
4. South Cringleford housing (looking south)	High	Minor adverse	Slight adverse	No change	Neutral
5. Cringleford footpath	High	Negligible adverse	Slight adverse	No change	Neutral
6. Norwich Road (Thickthorn Farm)	Low	Moderate adverse	Slight adverse	Negligible	Neutral
A. South Cringleford housing (looking west)	High	Negligible adverse	Slight adverse.	No change	Neutral
B. Norwich Road (Park and Ride)	Low	No change	Neutral	No change	Neutral
C. North Cringleford	High	No change	Neutral	No change	Neutral
D. Thickthorn Hall	High	Minor adverse	Slight adverse	Negligible (in winter)	Slight adverse
E. Station Lane (south of A11)	Low	Negligible	Neutral	No change	Neutral

- 7.10.48. The most substantial operation effects on representative viewpoints would associate with views from the south towards the proposed new Cantley Lane Link road and overbridges from Cantley Lane South and from the railside PRoW.
- 7.10.49. At year of opening significant visual effects would be experienced at representative viewpoints 1 and 2 with some slight (not significant) effects at viewpoints 3 (due to the introduction of the replacement Cantley Lane Footbridge (Cringleford)), 4 (due to tree removal along the A47), 6 (due to the new junction and visibility splays at Norwich Road) and D (due to glimpsed views through winter tree cover to traffic movements on the new Cantley Lane Link road and overbridges).
- 7.10.50. By year 15 of operation new planting proposed as part of the environmental masterplan would have reduced the visual effect at all representative viewpoints to not significant. The only remaining adverse visual effect would be the slight adverse (not significant) level of visual effect at representative viewpoints 1 (winter only), 2 and D (due to glimpsed views through winter tree cover to traffic movements on the new Cantley Lane Link road and overbridges). The long term residual visual effect at all other representative viewpoints has been assessed as neutral.

Effects on visual receptors

- 7.10.51. The effects on visual receptors within the study area are reported in Appendix 7.4 (Visual Receptors) **(TR010037/APP/6.3)** and located and graphically summarised on Figure 7.5. Visual Receptors **(TR010037/APP/6.2)**. These assessments take account of visual effects in both winter and summer and during the night. A summary of year 1 and year 15 visual effects on each receptor group is provided in Tables 7-12 and 7-13.

Table 7-12 : Year 1 operation effects on visual receptors (summary)

Visual receptor type	Significance – number of visual receptors affected				
	Very large adverse	Large adverse	Moderate adverse	Slight adverse	Neutral
Residential	0	1	2	4	13
Community	0	0	0	0	5
Commercial	0	0	0	0	2
PRoW	0	0	1	0	3
Roads	0	0	0	3	3

Table 7-13 : Year 15 operation effects on visual receptors (summary)

Visual receptor type	Significance – number of visual receptors affected				
	Very large adverse	Large adverse	Moderate adverse	Slight adverse	Neutral
Residential	0	1	1	0	18
Community	0	0	0	0	5
Commercial	0	0	0	0	2
PRoW	0	0	0	1	3
Roads	0	0	0	1	5

7.10.52. The following provides a general overview of the effects on each receptor type, summarising the potential nature, extent and significance of visual effects that would occur across the study area.

Residential receptors

7.10.53. The residential receptors identified in Tables 7.12 and 7.13 that would be subject to a significant operational visual effect in the year of opening of the Proposed Scheme are as follows:

- The six northern-most properties (in a horse-shoe formation) at the north eastern end of Cantley Lane South (closest to and potentially visually enclosed by the replacement Cantley Lane Footbridge (Cringleford) ramp and embankment) (R1 - Moderate adverse)
- [REDACTED] (R5 - Moderate adverse)
- [REDACTED] at Cantley Lane South (R6 - Large adverse) – particularly [REDACTED] with rear views facing towards and along the rising embankment of the Cantley Lane Link road to the north west

7.10.54. By year 15 of operation new planting proposed as part of the environmental masterplan would have reduced the visual effect at these and all other residential receptors. Significant visual effects at year 15 would be limited to:

- [REDACTED] (R5 - Moderate adverse)
- [REDACTED] at Cantley Lane South (R6 - Large adverse) – particularly [REDACTED] with rear views facing towards and along the rising embankment of the new Cantley Lane Link road to the north west

7.10.55. Other residential properties that have been identified as subject to slight (not significant) adverse visual effects in the year of opening are limited to [REDACTED] [REDACTED] (R4 – Slight adverse). In year 15 no properties would be subject to a Slight adverse visual effect.

Community receptors

7.10.56. The low to medium sensitivity of community receptors means that none would be subject to a significant visual effect in year of opening or year 15.

Commercial receptors

7.10.57. The low sensitivity of commercial receptors means that none would be subject to a significant visual effect in year of opening or year 15.

PRoW

7.10.58. One PRoW would be subject to a significant operational visual effect in the year of opening of the Proposed Scheme. This would be a Moderate adverse effect on railside footpath FP1 (Hethersett FP6). There would be no Slight adverse (not significant) effects on PROW in year of opening.

7.10.59. By year 15 of operation new planting proposed as part of the environmental masterplan would have reduced the visual effect on railside footpath FP1 (Hethersett FP6) to Slight adverse (not significant).

Road receptors

7.10.60. The low sensitivity of road receptors means that none would be subject to a significant visual effect in year of opening or year 15.

7.11. Monitoring

7.11.1. Ongoing maintenance and management interventions to achieve the environmental objectives of the Proposed Scheme, including the establishment and maintenance of compensatory woodland planting and screen planting, are set out in the EMP (**TR010037/APP/7.4**). Monitoring shall determine the effectiveness of the delivery of these mitigation measures linked to the landscape or screening requirements identified by this assessment and set out within the environmental masterplan. Planting and seeding, proposed as mitigation for landscape and visual effects, would be maintained in order to achieve their full establishment throughout construction and then handed over for a landscape-establishment maintenance period of five years, prior to handover to the future maintaining authority for on-going highway maintenance.

7.12. Summary

7.12.1. The LVIA chapter comprises a description of the existing environment and identification of the potential effects of the Proposed Scheme on surrounding landscape and visual receptors. The landscape receptors with potential to experience change as a result of the Proposed Scheme comprise surrounding

landscape character areas. The visual receptors with potential to experience change as a result of the Proposed Scheme comprise representative viewpoints and individual receptor locations. The assessment of landscape and visual effects includes consideration of the effect of change to or removal of existing landscape features; the effect of temporary construction works (including temporary compounds and haul routes); the effect of the introduction of new highway infrastructure; the effect of vehicles travelling along the Proposed Scheme; and the effect of the requirements identified in the environmental masterplan.

- 7.12.2. Overall, during and as a direct consequence of **construction** there would be a moderate adverse (significant) effect on **landscape** character. This would principally be associated with the removal of areas of woodland and individual trees.
- 7.12.3. During **construction** some receptors would be subject to very large to moderate adverse (significant) **visual** effects, associated with views of surrounding construction activities and haul routes. This would particularly be the case in the vicinity of the proposed junction of the new Cantley Lane Link road and the realigned section of Cantley Lane South near Cantley Stream. Receptors that would be subject to a significant construction phase effect on their visual amenity here would include [REDACTED], [REDACTED], 12 properties at the north western end of Cantley Lane South, the railside footpath (Hethersett FP6), the footpath and existing pedestrian footbridge over the A47 (Cringleford FP4), and vehicular users of Cantley Lane South (due to the higher sensitivity of this quiet country lane within a rural context). These effects are illustrated by the significant construction effects identified at representative viewpoints 1, 2 and 3.
- 7.12.4. At **year of opening** there would be moderate adverse (significant) effect on **landscape** character arising from the residual loss of vegetation, the relative prominence of Proposed Scheme infrastructure and changes in character at the junction with Cantley Lane South.
- 7.12.5. At **year of opening** there would be moderate to large adverse (significant) effects on some **visual** receptors. This would particularly be the case in the vicinity of the proposed junction of the new Cantley Lane Link road and the realigned section of Cantley Lane South near Cantley Stream. Receptors that would be subject to a significant year of opening effect on their visual amenity here would include six located at the north eastern end of Cantley Lane South (R1), [REDACTED] (R5); and [REDACTED] (R6). These effects are illustrated by the significant operational effects identified in the year of opening at representative viewpoint 2.

- 7.12.6. By **year 15** of operation, with the establishment of Proposed Scheme landscape mitigation, effects on **landscape** character would be slight adverse (not significant).
- 7.12.7. By **year 15** of operation the establishment of Proposed Scheme planting would contribute to screening and landscape integration. Significant **visual** effects at year 15 would be limited to residential properties close to the proposed new junction at Cantley Lane South, namely:
- [REDACTED] (R5) – Moderate adverse long term residual effect
 - [REDACTED] (R6) – Large adverse long term residual effect
- 7.12.8. DMRB LA107 requires that the effect of the Proposed Scheme on landscape and visual amenity is to be assessed independently and the outcome combined into a single conclusion on the **overall** likely significance of effect. Some significant effects have been identified by this assessment on individual receptors. These are generally associated with the temporary construction phase or are identified at year 1 before new planting has matured. Significant long term residual effects in year 15 are limited to the localised visual effect on a small number of residential properties at Cantley Lane South (three properties in two receptor locations at [REDACTED] and at [REDACTED]). Consequently, this assessment concludes that, overall, combining both landscape and visual effects and on all receptors and focusing on the longer term outcome, the Proposed Scheme would not result in a significant long term residual effect on landscape and visual amenity as a single combined consideration.

7.13. References

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7.14. Glossary

AIA – Arboricultural Impact Assessment

BOAT – Byway Open to All Traffic

BS – British Standard

CMLI – Chartered Member of the Landscape Institute

DCO – Development Consent Order

DMRB – Design Manual for Roads and Bridges

EIA – Environmental Impact Assessment

EMP – Environmental Management Plan

ES – Environmental Statement

GLVIA – Guidelines for Landscape and Visual Impact Assessment

LVIA – Landscape and Visual Impact Assessment

NCA – National Character Area

NMU – Non motorised user (pedestrians, cyclists and horseriders)

NSIP – Nationally Significant Infrastructure Project

PCF – Project Control Framework

PEIR – Preliminary Environmental Information Report

PRoW – Public Right of Way

ZTV – Zone of Theoretical Visibility